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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Louis B. Rosenberg

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EXAMINER

BRIER, JEFFERY A

ART UNIT

PAPER NUMBER

2628

MAIL DATE

DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/780,852	Applicant(s) ROSENBERG ET AL.	
	Examiner Jeffery A. Brier	Art Unit 2628	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 28 April 2008.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 82-92 and 102-105 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 82-92 and 102-105 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Response to Amendment

1. The amendments filed on 04/28/2008 and 01/03/2008 has been entered. The terminal disclaimer filed on 01/03/2008 has been approved and overcome the obvious type double patenting rejections set forth in the office action mailed on 09/27/2007.

Information Disclosure Statement

2. The information disclosure statement filed 04/28/2008 has been considered. References lined through are as either considered on 09/27/2007 or repeat citation or not submitted as indicated on the PTO/SB/08A form.

Response to Arguments

3. Applicant's arguments filed 04/28/2008 in view of the claim amendments have been fully considered and are persuasive to overcome previous 35 USC 112 second paragraph rejection set forth in the office action mailed on 09/27/2007.

Claim Rejections - 35 USC § 102

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 82-88, 90-92, and 102-105 are rejected under 35 U.S.C. 102(b) as being anticipated by the article by Adelstein et al. titled Design and Implementation of a Force

Reflecting Manipulandum for Manual Control Research DIC-Vol. 42, Advanced in Robotics, pp 1-12, 1992 cited on sheet 5 of 8 of 04/28/2008 IDS. This article in the abstract, introduction, and beginning on page 4 under the Mechanical Configuration to page 12 describes the claimed apparatus noting figure 4. Ground is discussed on page 3 second column first full paragraph. Flexible elements is inherently seen in figures 1-4 and 7 and discussed in the second paragraph under the heading Manipulandum Dynamic response on page 8 and page 4 first column last paragraph.

A detailed analysis of the claims follows.

Claim 82:

82. (Currently Amended) An apparatus (figures 1-4 and 7), comprising:
a manipulandum moveable in at least two degrees of freedom (The article uses the word manipulandum, see at least the abstract. The manipulandum moves in at least two degrees of freedom.);
a linkage coupled to the manipulandum, the linkage including a plurality of elements, at least a subset of elements from the plurality of elements being flexible and moveable to allow said manipulandum to move in at least one of said two degrees of freedom (Figures 1-4 and 7 shows and second paragraph under the heading Manipulandum Dynamic response on page 8 and page 4 first column last paragraph discusses flexible elements.); and
at least one sensor configured to detect at least one of a position and a movement of the manipulandum in the at least two degrees of freedom and output a

sensor signal based on the detected at least one of the position and the movement (See sensor section on page 8.).

Claim 83:

83. (Previously Presented) The apparatus of claim 82, further comprising an actuator coupled to the linkage, the actuator configured to output via the subset of elements a feedback force along at least one of the at least two degrees of freedom (A motor is connected to ground and a linkage. Figure 1 shows two motors. The abstract, Mechanical configuration section and the hardware implementation section discuss motor connected to the linkage.).

Claim 84:

84. (Previously Presented) The apparatus of claim 82, wherein the linkage includes:

a ground member configured to be coupled to a ground surface (Ground is discussed in the Reference Frame section and Spherical Mechanical Design and other sections.);

a first extension member and a second extension member, the first extension member and the second extension member being coupled to the ground member (See figure 4.); and

a first central member and a second central member, the first central member having an end coupled to the first extension member, the second central member having an end coupled to the second extension member, the first central member and

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the second central member being coupled to each other at ends opposite the ends coupled to the first extension member and the second extension member (See figure 4).

Claim 85:

85. (Previously Presented) The apparatus of claim 82, wherein the linkage includes:

a ground member configured to be coupled to a ground surface (Ground is discussed in the Reference Frame section and Spherical Mechanical Design and other sections.);

a first extension member and a second extension member, the first extension member and the second extension member being coupled to the ground member (See figure 4.); and

a first central member and a second central member, the first central member having an end flexibly coupled to the first extension member, the second central member having an end flexibly coupled to the second extension member, the first central member and the second central member being coupled to each other at ends opposite the ends coupled to the first extension member and the second extension member (See figure 4).

Claim 86:

86. (Previously Presented) The apparatus of claim 82, wherein the linkage includes:

a ground member configured to be coupled to a ground surface (Ground is discussed in the Reference Frame section and Spherical Mechanical Design and other sections.);

a first extension member and a second extension member, the first extension member and the second extension member being coupled to the ground member (See figure 4.); and

a first central member and a second central member, the first central member having a first end coupled to the first extension member, the second central member having a first end coupled to the second extension member, a second end of the first central member and a second end of the second central member being coupled to each other (See figure 4.),

the ground member being rotatably coupled to the first extension member and the second extension member by bearings, the bearings configured to permit rotation of the first extension member and the second extension member (See the Electromechanical Linkage spanning pages 7 and 8. The first, second and fourth paragraphs of this section paragraph discuss bearings at the ground couple ground to the linkages.).

Claim 87:

87. (Previously Presented) The apparatus of claim 82, wherein at least one element from the subset of elements is narrower in a dimension in which that element is configured to flex, and is wider in other dimensions in which that element is configured to be substantially inflexible (See figures 1 and 4.).

Claim 88:

88. (Previously Presented) The apparatus of claim 82, further comprising:

a first actuator coupled to the linkage, the actuator configured to output via the subset of elements a feedback force in at least one of the at least two degrees of freedom based on the sensor signal (See figures 1 and 4 which show a motor for each linkage connected to ground used to provided force feedback to the manipulandum.); and

a second actuator coupled to the ground member, the second actuator being configured to apply a feedback force in at least one of the at least two degrees of freedom based on the sensor signal, the feedback force associated with the second actuator being different from the feedback force associated with the first actuator (See figures 1 and 4 which show a motor for each linkage connected to ground used to provided force feedback to the manipulandum.).

Claim 90:

90. (Currently Amended) An apparatus (figures 1-4 and 7), comprising:

a manipulandum moveable in at least two degrees of freedom about axes of rotation with respect to a reference (The article uses the word manipulandum, see at least the abstract. The manipulandum moves in at least two degrees of freedom.);

a first member coupled to the manipulandum (See figure 4, linkage between joints j5 and j4.);

a second member coupled to the first member and having a flexible characteristic (See figure 4, linkage between joints j5 and j3); and

a third member coupled to the first member and having a flexible characteristic (linkages between joints j4 and j1.).

Claim 91:

91. (Previously Presented) The apparatus of claim 90, wherein the first member and the second member are coupled to an intermediate member that is coupled to the manipulandum (Handle of manipulandum is an intermediate member.).

Claim 92:

92. (Currently Amended) The apparatus of claim 90, wherein, the second member has a first dimension about which the second member is configured to flex, and has a second dimension about which the second member is configured to be substantially inflexible (The linkages are thin thus they have flex.).

Claim 102:

102. (Previously Presented) The apparatus of claim 90, further comprising:
an actuator coupled to the manipulandum, the actuator configured to output a feedback force along at least one of the at least two degrees of freedom (See figures 1 and 4 which show a motor for each linkage connected to ground used to provided force feedback to the manipulandum.).

Claim 103:

103. (Previously Presented) The apparatus of claim 90, further comprising:
a sensor configured to detect a position of the manipulandum along at least one of the at least two degrees of freedom and output a sensor signal based on the detected position (See sensor section on page 8.).

Claim 104:

104. (Previously Presented) The apparatus of claim 90, wherein the manipulandum includes one of a simulated surgical tool, a stylus, or a joystick (Starting on the last paragraph on page 4 to page 8 the term joystick is used many times.).

Claim 105:

105. (New) The apparatus of claim 90, wherein, the third member has a first dimension about which the third member is configured to flex, and has a second dimension about which the third member is configured to be substantially inflexible (The linkages are thin, thus they have flex.).

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claim 89 is rejected under 35 U.S.C. 103(a) as being unpatentable over the article by Adelstein et al. titled Design and Implementation of a Force Reflecting Manipulandum for Manual Control Research DIC-Vol. 42, Advanced in Robotics, pp 1-12, 1992 cited on sheet 5 of 8 of 04/28/2008 IDS as applied to claim 82 further in view of the article by Lorentz Levitation Technology: a New Approach to Fine Motion Robotics, Teleoperation, Haptic Interfaces, and Vibration Isolation, R. L. Hollis, S. E. Salcudean, 1993, 5th International Symposium on Robotics Research, Hidden Valley, PA, October 1-4, 1993, pages 1-18.

Hollis discusses Lorentz motors used in controlling a manipulandum or joystick and discusses on page 3 second column voice coil as an example of Lorentz motor.

Claim 89:

89. (Previously Presented) The apparatus of claim 82, further comprising an actuator coupled to the linkage, the actuator configured to output via the subset of elements a feedback force along at least one of the at least two degrees of freedom, the

actuator including a voice coil actuator configured to impart the feedback force on the manipulandum.

Adelstein is silent with regards to voice coil actuator, however, in view of Hollis it would have been obvious to one of ordinary skill in the art at the time of applicants invention to use a linear motor rather than a rotary motor to apply force to Adelsein's linkages because Hollis teaches linear motor such as voice coil motor is used to control a manipulandum.

Conclusion

8. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffery A. Brier whose telephone number is (571) 272-7656. The examiner can normally be reached on M-F from 7:30 to 4:00. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Razavi, can be reached at (571) 272-7664. The fax phone Number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Jeffery A. Brier/
Primary Examiner, Division 2628